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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/816,691

04/01/2004

Eric R. Blomiley

MI22-2510

1647

21567 7590 11/25/2008
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EXAMINER

DHINGRA, RAKESH KUMAR

ART UNIT

PAPER NUMBER

1792

MAIL DATE

DELIVERY MODE

11/25/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/816,691	Applicant(s) BLOMILEY ET AL.	
	Examiner RAKESH K. DHINGRA	Art Unit 1792	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 03 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 August 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6,9-22,25-29,32,33,37,162 and 163 is/are pending in the application.
- 4a) Of the above claim(s) 9,10,15-21,25-29,32,33 and 163 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6,11-14,22,37 and 162 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 April 2007 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>08/08</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

Newly submitted claim 163 directed to an invention that is independent or distinct from the invention originally claimed for the following reasons:

Applicant had elected species 1 (Figs. 3, 4) and identified claims 1-8, 11-14, 22, 31, 34, 37, 40-42 and 44 as readable on the elected species. Newly added claim 163 recites limitation “recess outer peripheral vertical sidewall, the respective projection radial inner vertical sidewalls, and the respective projection radially extending uppermost straight surfaces in combination have an elevational length which less than thickness of a substrate for which the susceptor is designed” which pertains to Fig. 7 {similar to original claim 39 (non-elected invention)}. Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claim 163 is withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

Response to Arguments

Applicant's arguments with respect to claims 1-6, 11-14, 22, 30, 37 and 162 have been considered but are moot in view of the new ground(s) of rejection as explained hereunder.

Applicant has amended claim 1 by adding new limitations like “the recess base having an radially outermost portion having an uppermost surface received at an elevation, the outer peripheral vertical sidewall” etc. Further applicant has cancelled claim 30 and added new claim 163.

Accordingly claims 1-6, 9-22, 25-29, 32, 33, 37, 162 and 163 are now pending out of which claims 1-6, 11-14, 22, 37, 162 are presently active.

New references [Scudder et al (US 2005/0016466) and Tepman et al (US 5,228,501)] when combined read on limitations of amended claim 1. Accordingly claims 1-4 and 11 have been rejected under 35 USC 103 (a) as explained below. Further, balance claims 5, 6, 12-14, 22, 37 and 162 have also been rejected under 35 USC 103 (a) as explained below.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later

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invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-4 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Scudder et al (US 2005/0016466) in view of Tepman et al (US 5,228,501).

Regarding Claim 1: Scudder et al teach a substrate susceptor for receiving a substrate to be deposited upon, comprising:

a body 524 having a substrate receiving side, the substrate receiving side comprising a face having a substrate receiving recess 525 formed therein, the recess 525 comprising an outer peripheral vertical sidewall 527 and a recess base 526, the recess base 526 having a radially outermost portion having an uppermost surface (at a height h1 from the recess base 526) received at an elevation, the outer peripheral vertical sidewall of the recess 527 joining with the uppermost surface of the radially outermost portion at said elevation and extending perpendicularly upward from where it joins with said uppermost surface of the radially outermost portion at said elevation; and

at least three projections 550 extending outwardly from a portion of the face, the projections respectively comprising a radially inner vertical sidewall (extending upwards from the projection front edge 551) which aligns with and extends outwardly from the recess outer peripheral vertical sidewall 527 to a projection radially extending uppermost straight surface which is towards the substrate receiving recess, all of the radially inner vertical sidewall (of projection 550) aligning with and extending outwardly from the recess outer peripheral vertical sidewall 527 perpendicularly and vertically relative to the recess base 526 to the projection radially

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extending uppermost straight surface, the projections respectively comprising a vertical radially outermost peripheral edge (the outermost radial edge of the projection 550), the radially extending uppermost straight surface extending radially outward from the radially inner vertical sidewall to an elevationally uppermost and radially outermost location which is received radially at the vertical radially outermost peripheral edge (e.g. Figs. 6A-6F and para. 0030-0034).

Scudder et al do not teach the projection radially extending uppermost straight surface of the at least three projections is angled radially downward toward the substrate receiving recess.

Tepman et al teach a substrate support for a deposition apparatus comprising a support ring with a plurality of projections 133 that have a radially extending uppermost surface 33 that is angled radially downwards to help center the wafer onto the wafer support (e.g. Fig. 3 and col. 8, lines 15-45).

Therefore it would have been obvious to one of ordinary skills in the art at the time of the invention to provide the projections with radially extending uppermost straight surface that is angled radially downward toward the substrate receiving recess as taught by Tepman et al in the apparatus of Scudder et al to help center the wafer in the recess and thus improve uniformity of deposition on the wafer surface.

Regarding Claims 2-4: Scudder et al teach that face portion of the susceptor is annular and is substantially planar (Figs. 6A-6C).

Regarding Claim 11: Scudder et al teach that guide pins 550 (projections) are received about a circle on the face portion of the susceptor 524 (Fig. 6A-6F).

Claims 5, 6, 12-14, 22 and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Scudder et al (US 2005/0016466) in view of Tepman et al (US 5,228,501) as applied to claims 1-4, 11 and further in view of Fodor et al (US 7,024,105).

Regarding Claim 5: Scudder et al in view of Tepman et al teach all limitations of the claim except that substrate receiving recess is annular.

Fodor et al teach a substrate heater assembly comprising a support body 804 with an annular recess 816 for holding a substrate 112 and where the recess includes an outer peripheral vertical sidewall 814 (e.g. Fig. 8 and col. 6, line 50 to col. 7, line 18).

Therefore it would have been obvious to one of ordinary skills in the art at the time of the invention to provide an annular substrate receiving recess in the substrate holder body as taught by Fodor et al in the apparatus of Scudder et al in view of Tepman et al to minimize damage to wafer due to minimal contact with the backside of wafer and also due to different thermal expansion of the wafer and the substrate support body material during heating of the substrate.

Regarding Claim 6: Fodor et al teach that face portion 806 is annular (Fig. 8).

Regarding Claims 12-14: Fodor et al teach another embodiment (Figs. 2A, 2B, 3A, 3B, 4A, 4B) comprising a substrate holding body 132 with a substrate receiving 150 wherein a substrate 112 is supported. Fodor et al also teach a ring 134 with a continuous lip 302 (similar to the recess having an outer peripheral vertical side wall with a projecting lip). Fodor et al further teach that lip 302 is used to guide the substrate 112 into the pocket 150. Fodor et al additionally teach that instead of the continuous lip 302, ring can have crowns (projections) 402 for guiding the substrate into the pocket. Fodor et al also teach that the width of crowns ranges from 0.5 to 5 mm and that crowns can number from 3 to 12. Assuming the inner diameter of ring to be 200

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mm (size of wafer), the circumference of ring would be approx 600 mm, and assuming the number of projections to be say 6, the projections would collectively occupy between 1.5 % to 5% of the circumference of the circle which meets the claim limitations of 3-10% (col. 5, lines 32-45). It would be obvious to use plurality of projections instead of a continuous lip to minimize the area of contact with the edge of the wafer during guiding of the wafer into the pocket.

Regarding Claim 22: Fodor teach that the body 134 has an outermost peripheral edge, the projection vertical radially outermost peripheral edge (of projections 402) being received radially inward of the body outermost peripheral edge (Fig. 4A).

Regarding Claim 37: Fodor et al teach the elevationally upper most location (of projections 914) has an uppermost elevation which is received higher than an uppermost surface of a substrate 112 for which the susceptor is designed when said substrate is received by said recess 816 (Figs. 9A-9D).

Claim 162 is rejected under 35 U.S.C. 103(a) as being unpatentable over Scudder et al (US 2005/0016466) in view of Tepman et al (US 5,228,501) as applied to claims 1-4, 11 and further in view of Mahawilli (US 6,530,994).

Regarding Claim 162: Scudder et al in view of Tepman et al teach all limitations of the claim except that the body comprises SiC coated graphite.

Mahawilli teaches a CVD apparatus with a substrate support body 10 that comprises SiC coated graphite (e.g. Figs. 3, 4 and col. 5, lines 19-30).

Therefore it would have been obvious to one of ordinary skills in the art at the time of the invention to provide the substrate support body that comprises SiC coated graphite as taught by Mahawilli in the apparatus of Scudder et al in view of Tepman et al as known materials for use in the heated substrate support assemblies in CVD equipment.

In this regard courts have ruled:

The selection of a known material based on its suitability for its intended use is prima facie obviousness. *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to RAKESH K. DHINGRA whose telephone number is (571)272-5959. The examiner can normally be reached on 8:30 -6:00 (Monday - Friday).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on (571)-272-1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Rakesh K Dhingra/
Examiner, Art Unit 1792

/K. M./
Primary Examiner, Art Unit 1792